FINAL PROPOSED PLAN TO ADDRESS ZONE E, OPERABLE UNIT 12, LANDFILL 4

F. E. WARREN AIR FORCE BASE, WYOMING

OVERVIEW OF THE PROPOSED PLAN

The United States Air Force (USAF) has developed this Proposed Plan that identifies the preferred alternative for the final remedy for Landfill 4 (LF4). The preferred alternative for LF4 is to improve the existing soil cover, remove concrete and debris from the landfill surface, remove and dispose small pockets of unburned waste, and initiate a long-term monitoring program. The Proposed Plan also describes the rationale for this preferred alternative and summarizes other remedial alternatives evaluated for this site.

This document is issued by the USAF, the US Environmental Protection Agency (EPA), and Wyoming Department of Environmental Quality (WDEQ). USAF, along with the EPA and WDEQ, will select a final remedy for the site after reviewing and considering all of the information submitted. USAF, may modify the preferred alternative or select another response action based on new information or public comments. Therefore, the public is encouraged to review and comment on all of the alternatives presented in this Proposed Plan.

Your comments: Comments on this Proposed Plan are welcomed during the comment period and during the public meeting, which will be held on 23 September 2003. Your comments will be considered during the decision on the final response action for LF4.

PUBLIC MEETING

September 23, 2003
7:00 p.m.

Little America Motel & Resort, Regency Room,
2800 West Lincolnway
Cheyenne, Wyoming

PUBLIC COMMENT PERIOD

9 September 2003 to 9 October 2003

For more information, see the Administrative Record at the following location:

Laramie County Library
2800 Central Avenue
Cheyenne, WY 82001-2702
(307) 634-3561
Hours: Mon –Thur
10:00 a.m. - 9:00 p.m.
Hours: Fri – Sat
10:00 a.m. - 6:00 p.m.

INTRODUCTION

This Proposed Plan addresses LF4 within Zone E, Operable Unit 12 at F. E. Warren Air Force Base (F. E. Warren), Wyoming.

The USAF has prepared this Proposed Plan as part of its public participation responsibilities under Section 300.430(f)(2) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The Proposed Plan is issued collectively by the USAF, EPA, and WDEQ. EPA is the lead regulatory agency, and WDEQ is the support agency.

The Proposed Plan summarizes information that can be found in greater detail in the *Landfill 4 Remedial Investigation Report* and the *Landfill 4 Feasibility Study Report*, as well as other documents contained in the Administrative Record for this site. The USAF, EPA, and WDEQ encourage the public to review these documents to gain a more complete understanding of the site and Superfund activities.

The Administrative Record for F. E. Warren is located at the Laramie County Library in Cheyenne, Wyoming. The public can also access Administrative Record materials in the F. E. Warren Restoration Management office.

SITE BACKGROUND

F. E. Warren is located on 5,866 acres adjacent to the western city limits of Cheyenne (Figure 1). F. E. Warren was placed on the EPA's National Priorities List (NPL) in February 1990. As a result, F. E. Warren entered into the Installation Restoration Program

(IRP) which presently includes 20 sites. The sites are divided into a system of seven investigation zones. Zone E is one of these seven investigation zones. LF4 is a site located in Zone E.

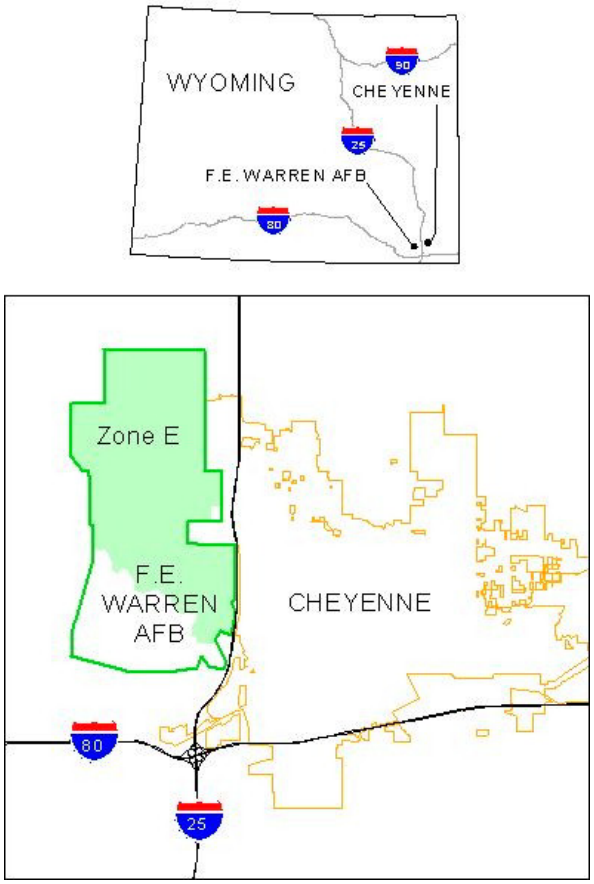

FIGURE 1 ZONE E, F. E. WARREN AFB LOCATION MAP

Zone E encompasses the area of F. E. Warren north of Crow Creek, excluding the Firing Ranges. Landfill 4 is located in the southeast corner of Zone E, in the vicinity of Gate 2 (Figure 2), and comprises about 28 acres. LF4 is split into two units by Missile Drive. Landfill 4a (LF4a) is south of Missile Drive and covers approximately 20 acres, while Landfill 4b (LF4b) is north of Missile Drive and covers approximately about 7 acres. Active railway tracks with frequent traffic are located on the north side of LF4b. An area east of LF4b encompassing about 1 acre was also identified as an area used for landfilling.

LF4a and LF4b were historically a single landfill area. Aerial photographs indicate that Missile Drive was constructed between 1956 and 1960. Some wastes were removed from under the road during construction.

Based on available Federal Emergency Management Agency (FEMA) mapping, about 9 acres of Landfill 4a are potentially located within the 100-year floodplain of Crow Creek.

The LF4 area is currently an open field and is not used for Base operations. Current and future land use for LF4 and the immediately surrounding areas is open space. The main current use in the area is limited to base vehicular traffic along Missile Drive and military security personnel stationed at base entrance, Gate 2. Security personnel use dirt roads within and surrounding the landfill while patrolling the base.

LF4 was operated as a sanitary landfill from 1947 until 1959. Refuse was disposed at LF4 using a trench and fill process. The refuse included domestic wastes (e.g., paper, bottles, cans, food containers and housewares) and light construction and industrial debris (metal and concrete fragments, nails, wire, rope, glass, and empty containers). Most of the waste was placed in trenches within the landfill, burned in the trench, and then covered with soil. Two small areas of unburned waste (about 1 acre each) exist in the area of LF4.

After the landfill closed, a soil and grass cover was placed over the area. Since that time, concrete and other construction debris (e.g. tiles) were deposited along the southern portion of LF4a (about 3 acres). Additional cover soil was added between 1988 and 1990.

A Surface Water Risk Assessment (SWRA) was conducted from 2000 to 2001 for Crow Creek, Diamond Creek, and an unnamed tributary to Crow Creek. The main objective of the SWRA was to assess potential risks to human health and the environment from exposure to contaminants found in sediment and surface water. Although contaminants were detected at low concentrations in the streams, the SWRA concluded there is little to no risk for either human health or ecological receptors. These results are based on the concentrations and toxicological characteristics of the chemicals of potential concern.

The USAF, under the oversight of EPA and WDEQ, investigated LF4 in 2001 and 2002. Waste and soil samples were collected to assess contamination in soil. Groundwater monitoring wells were installed and sampled to assess contamination in groundwater. Existing groundwater monitoring wells in LF4 were also sampled to compare with sampling results from previous years.

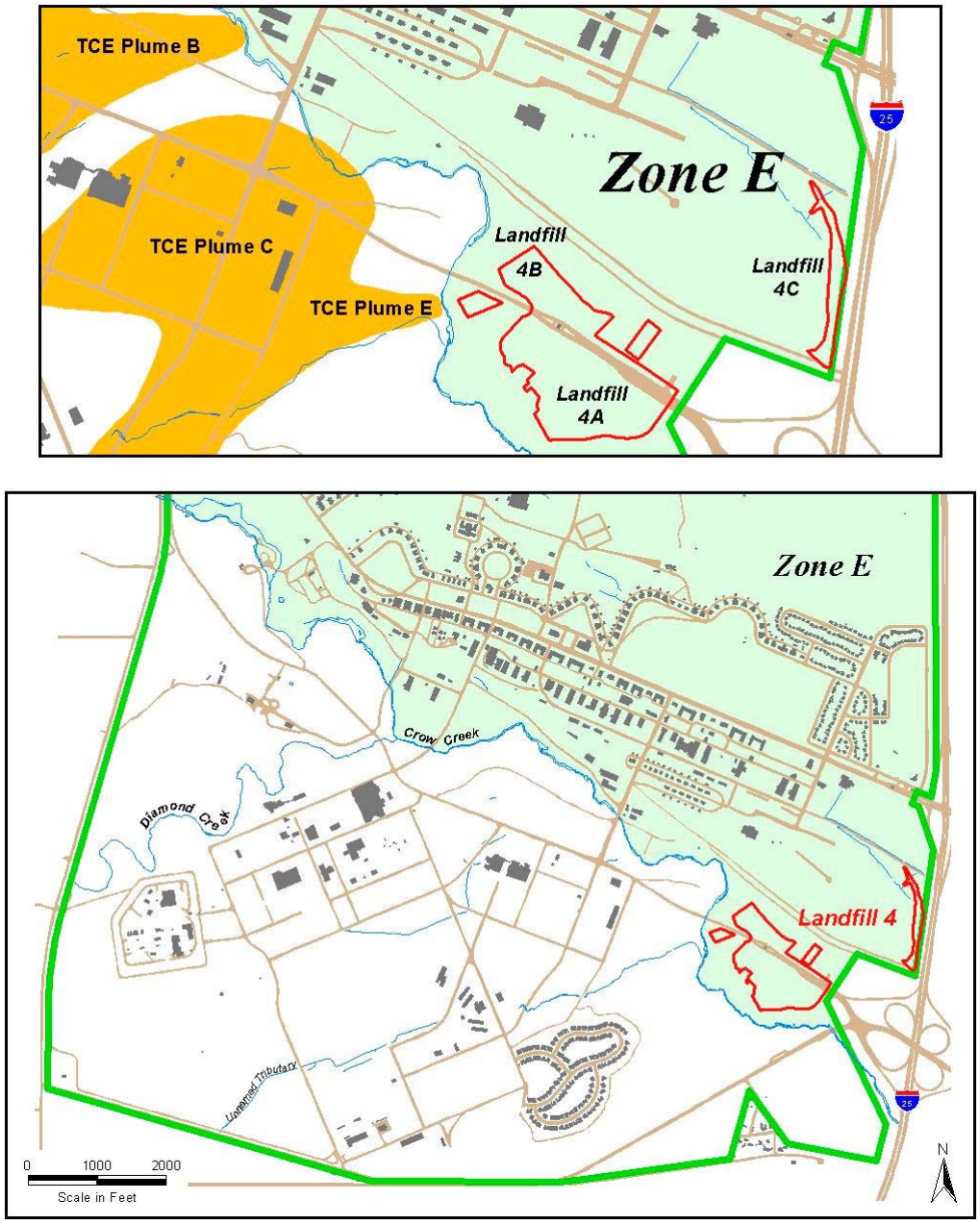

FIGURE 2 LANDFILL 4 SITE MAP

A third area located on the eastern boundary of F. E. Warren adjacent to I-25, which was suspected to be a landfill (Landfill 4c [LF4c]) was investigated during the RI. The investigation did not find any evidence of waste disposed and concluded that the area is an old railway spur.

The results of the investigation are provided in the RI report.

No previous remedial actions have been performed at LF4. However, the USAF has conducted several site investigations and is leading the remedial effort.

SITE CHARACTERISTICS

The topography of LF4 gradually slopes towards Crow Creek. The ground surface to the south of the landfill (near Crow Creek) is about 5 feet above Creek Creek. The ground surface to the north of the landfill (near the railroad tracks) is about 30 feet above Crow

Creek. The landfill cover is particularly uneven in areas where buried waste and soil have settled causing depressions. Following rain storms or snow melt, water collects in these depressions and may increase infiltration into the landfill. Up to 5 feet of additional cover material (soil) was placed over Landfill 4a between 1988 and 1990. A native grass cover is present over the entire landfill.

The shallow groundwater beneath the landfill typically flows towards Crow Creek, however the groundwater flow in the floodplain of Crow Creek is parallel to the Creek. To further complicate the groundwater flow, deep groundwater flows upward in some areas and Crow Creek surface water discharges into groundwater in other areas. The soils in the shallow groundwater aquifer beneath LF4 vary from high permeability sandy gravels (water flows easily) to low permeability silty clays (minimal water movement). The depth to groundwater ranges from 2 feet below ground surface (bgs) to the south of the landfill (near Crow Creek) to 18 ft bgs north of the landfill (near the railway tracks).

About 4,800 linear feet of test trenches were completed across LF4 during the investigation in 2001. The investigation activities confirmed that most of the waste was burned. The investigation found that LF4 waste is typically present in narrow trenches (typically 3 to 6 feet wide). The thickness of the soil cover over the waste varies from 2 to 10 feet bgs and the thickness of the waste varies from 1 to 5 feet.

Waste was encountered below the groundwater table in some locations, particularly in the southern half of Landfill 4 closer to Crow Creek. Groundwater was also observed in some waste trenches due to the extremely slow infiltration of snow melt or precipitation. It is estimated that between 60 and 80 percent of the landfill waste within LF4a was in contact with groundwater at the time of the RI.

Waste and soil samples were collected from the trenches and test pits. Surface and subsurface soils were found to contain minor contamination with some concentrations slightly above F. E. Warren basewide background concentrations. The waste was found to contain low levels of organic compounds and detections of various inorganic compounds. The contaminants found in the waste are summarized under the “Contaminants of Potential Concern” bulletin.

Groundwater monitoring wells were sampled and found to contain slightly elevated concentrations of some organic and inorganic compounds. Although the concentrations of some inorganic compounds (aluminum, iron, lead, and manganese) exceeded EPA and WDEQ groundwater standards, the concentrations may be naturally occurring and not a result of landfill impact on groundwater (based on analytical data from 2001 and 2002). These inorganic compounds are naturally occurring throughout the Base in sediment, soil, groundwater, and surface water. Trichloroethene (TCE) was detected in groundwater south of the landfill but not within the landfill. The TCE is believed to be from Plumes C and E and is transported in groundwater along the flood plain of Crow Creek.

The data indicates that both inorganic and organic compounds are relatively immobile within the landfill waste based on comparisons to EPA soil screening levels. This was also confirmed by concentrations in the groundwater at or below naturally occurring background concentrations.

The concentrations of compounds were also measured in surface water and sediment samples collected from Crow Creek. In general, the concentrations of compounds in surface water and sediment samples do not show an increasing trend as Crow Creek passes LF4. Some compounds have slightly elevated concentrations at sample locations adjacent to LF4 when compared to upstream locations, but do not show a consistent increasing trend. The range of concentrations of compounds in surface water is consistent with the range of concentrations detected in surface water samples collected as part of the SWRA. The Surface Water and Sediment Risk Assessment concluded that there is little to no risk for either human health or ecological receptors.

SUMMARY OF SITE RISKS

LF4 is located in an open field and is not used for Base operations.

1. Human Health Risk: Possible exposure scenarios in the future include child and adult residents, on-site workers, adult and child recreational visitors, and construction workers. Using these as assumed exposures, the assessment indicates no unacceptable risk to human health from chemicals in the soils or groundwater. Iron and manganese were treated as background in the risk assessment.

2. Ecological Risk: Low to Moderate adverse effects to the plant community, soil invertebrates, small mammals and birds from exposure to several metals and two organic compounds in surface soils. There is no

apparent risk to soil invertebrates in surface soil. Low risks were estimated for plants exposed to selenium in surface soils and lead in shallow subsurface soil. However, evidence exists which suggests that risks are, if present, minimal. This evidence includes the presence of an apparently healthy grass community and the likely overestimation of bioavailability.

It is the lead agency's (USAF), EPA's, and WDEQ's current judgment that the Preferred Alternative identified in this Proposed Plan, or one of the other active measures considered in the Proposed Plan, is necessary to ensure the long-term stability of the landfill.

CONTAMINANTS OF POTENTIAL CONCERN

The main contaminants in waste at LF4 include low levels of polycyclic aromatic hydrocarbons (PAHs), dioxins and furans, VOCs, various metals, some polychlorinated biphenyls (PCBs) and pesticides. Each of these contaminants is found in localized areas and does not represent a uniform distribution.

PAHs: Polycyclic aromatic hydrocarbons (PAHs) are a group of chemicals that are components of crude and refined petroleum products and coal. PAHs are also produced by the incomplete burning of garbage, or other organic substances. At LF4, PAHs are detected at low concentrations where organic material within waste may not have burned completely. PAHs found at LF4 include benzo(a)pyrene, benzo(a)anthracene, and benzo(b)fluoranthene. PAHs were detected during one sampling event (2001) at very low concentrations within groundwater downgradient of LF4.

Dioxins and Furans: These are found in the environment as chemical byproducts and are not intentionally manufactured. At LF4, dioxins and furans were detected in the waste at very low concentrations, likely associated with incomplete combustion of organic materials.

VOCs: Volatile organic compounds are not found naturally in the environment and are usually manufactured as fuels, solvents or degreasers. They can also occur as breakdown products of other VOCs. VOCs detected at very low concentrations (less than 1 mg/kg) in waste at LF4 included benzene, ethylbenzene, toluene, xylene (BTEX), TCE, and Polychloroethene (PCE). TCE was detected in groundwater as a result of TCE contaminated groundwater being transported parallel to Crow Creek from TCE Plumes C and E.

PCBs and Pesticides: These contaminants are manmade. They are contained in chemicals that were widely used in the manufacture of transformers and capacitors. Pesticides were detected in some waste samples at low concentrations (less than 1 mg/kg except for one sample), including 4,4-DDE, 4,4-DDT, dieldrin and chlordane. PCB-1254 was detected at the highest concentration (23 mg/kg) in a waste sample collected from unburnt trash. PCBs and pesticides were not detected in groundwater.

Metals/Inorganic Constituents: Metals/inorganics can occur as a result of manmade sources or naturally from weathering of sediment and bedrock. Several metals/inorganics were detected in waste samples, but few metals/inorganics were detected in groundwater at elevated concentrations. The metals/inorganics of concern in groundwater at LF4 include aluminum, iron, lead and manganese.

SUMMARY OF REMEDIAL ALTERNATIVES

Remedial alternatives for LF4 are presented below. The alternatives are numbered to correspond with the alternatives presented in the FS. The costs and time to achieve Remedial Action Objectives (RAOs) for each alternative are summarized in Table 1.

Alternative 1 – No Action
Alternative 2 – Institutional Controls
Alternative 3 – Localized Site Improvements
Alternative 4 – Capping the Landfill
Alternative 5 – Excavation and Removal

Alternative 1 No Action

Regulations governing the Superfund program require that the "no action" alternative be evaluated to establish a baseline for comparison. The No Action alternative will not meet the RAOs.

Alternative 2 Institutional Controls

Alternative 2 consists of physical and/or administrative controls to limit access and development at LF4. LF4 will be permanently identified as a landfill area, which will need to be maintained into the foreseeable future. Access to the area will be controlled and activities inconsistent with the operation and maintenance of the area prohibited. Soils and waste will be left in their current location. This alternative is easily implemented but will not meet RAOs.

REMEDIAL ACTION OBJECTIVES (RAOs)

RAOs identified for LF4 are as follows:

1. Limit the potential for ponding of storm water on the landfill surface.
2. Reduce the potential for soil erosion by wind and water.
3. Limit potential for contact with landfill materials and groundwater that create a hazard to humans.
4. Restoration of ground water to beneficial use, which in this case is restoration of iron and manganese to background conditions. Background conditions are best evaluated through future monitoring to address temporal and spatial variations. If iron and manganese concentrations in ground water at LF4 are confirmed to be within background through future monitoring, there will be no further requirement for restoration.

SCOPE AND ROLE OF THE PREFERRED REMEDY

The preferred remedy is Alternative 3 – Localized Site Improvements. This remedy involves:

- Removing and disposing of the two areas of unburnt waste at a proper off-site landfill facility
- Removing or recycling the surficial concrete and construction debris
- Adding clean fill cover (approx. 6,000 cubic yards) to limit storm water ponding, and promote positive drainage
- Re-planting vegetation over landfill areas disturbed by construction to inhibit erosion and reduce storm water infiltration
- Monitoring groundwater and surface water to verify if iron and manganese are naturally occurring background concentrations in groundwater and to assess the long-term effectiveness of the alternative

This action will reduce contaminant mobility by reducing storm water infiltration and erosion. Contaminant toxicity and volume will be reduced by the removal of the unburnt waste and through natural attenuation processes.

Alternative 3 Localized Site Improvements

Alternative 3 consists of localized site improvements at the site. It includes removal and disposal at a off-site landfill facility of the two areas of unburned waste, removal or recycling of the surficial concrete and construction debris, placement of clean fill on the landfill to ensure proper drainage and to limit storm water ponding, and re-planting areas disturbed by construction. Site activities are expected to take about 1 to 2 months to complete. This remedy also includes long-term surface and groundwater monitoring. Because the landfill will remain in place, institutional controls, as described in Alternative 2, will also be implemented. This alternative has minimal negative short-term effects. It reduces contaminant mobility by limiting infiltration of precipitation into the landfill waste and reduces toxicity or volume of the contamination by removal of the unburnt wastes. This alternative meets the RAOs.

Alternative 4 Capping the Landfill

Alternative 4 involves installing a low-permeability cap over LF4, and grading and revegetating the area, and a long-term surface and groundwater monitoring program. This alternative is estimated to take about 3 to 6 months to implement. This remedy also includes long-term surface and groundwater monitoring. Because the landfill will remain in place, institutional controls, as described in Alternative 2, will also be implemented. This alternative does not reduce contaminant toxicity or volume; however, it would reduce the mobility of many types of contaminants present in the landfill. This alternative meets the RAOs.

Alternative 5 Excavation and Removal

Alternative 5 involves excavating LF4 and disposing of the waste material at an authorized landfill facility. This alternative has the greatest cost of all five alternatives and will also take the longest to implement about 6 to 12 months. This alternative does not involve treatment, however reduction of contaminant toxicity and volume at LF4 will occur as a result of the waste excavation and disposal off-site. The removal and disposal of the wastes would also reduce contaminant mobility. This alternative meets the RAOs.

Table 1 – SUMMARY OF REMEDIAL ALTERNATIVE COSTS AT LANDFILL 4

Alternative	Capital Cost	O&M Cost	Net Present Value	Time to RAOs
1. No Action	$ 0	$ 0	$ 0	NA
2. Institutional Controls	$ 80,000	$ 60,000	$ 110,000	NA
3. Localized Site Improvements	$ 1,950,000	$ 5,118,500	$ 4,900,000	2 months
4. Capping the Landfill	$ 4,730,000	$ 5,151,000	$ 7,700,000	6 months
5. Excavation and Removal	$ 8,200,000	$ 3,006,000	$ 9,900,000	12 months

Notes:

NA = not applicable
O&M = operations and maintenance

Table 2 – EVALUATION CRITERIA FOR SUPERFUND REMEDIAL ALTERNATIVES

Threshold Criteria – Criteria must be met before an alternative can be considered as a remedy	**Overall Protection of Human Health and the Environment** describes how an alternative eliminates, reduces, or controls threats to public health and the environment through institutional controls, engineering controls, or treatment.
	Compliance with Applicable or Relevant and Appropriate Requirements (ARARs) evaluates whether the alternative meets federal and state environmental statutes, regulations, and other requirements that pertain to the site, or whether a waiver is justified.
Balancing Criteria – Relative tradeoffs between different criteria are evaluated	**Long-Term Effectiveness and Permanence** considers the ability of an alternative to maintain protection of human health and the environment over time.
	Reduction of Toxicity, Mobility, or Volume of Contaminants Through Treatment evaluates an alternative's use of treatment to reduce the harmful effects of the principal contaminants, their ability to move in the environment, and the amount of contamination present.
	Short-term Effectiveness considers the length of time needed to implement an alternative and the risks the alternative poses to workers, residents, and the environment during implementation.
	Implementability considers the technical and administrative feasibility of implementing the alternative, including factors such as the relative availability of goods and services.
	Costs includes estimated capital and annual operations and maintenance costs, as well as present worth cost. Present worth cost is the total cost of an alternative over time in terms of today's dollar value. Cost estimates are expected to be accurate within a range of +50 to –30 percent.
Modifying Criteria – Evaluate whether remedy is supported by state and community after the public comment period	**State/Support Agency Acceptance** considers whether the State agrees with or opposes the preferred alternative. WDEQ reviews and comments upon all important documents throughout the process.
	Community Acceptance considers whether the local community agrees with or opposes the preferred alternative. Comments received on the Proposed Plan are an important indicator of community acceptance.

EVALUATION OF ALTERNATIVES

In accordance with EPA guidance, the nine criteria listed in Table 2 are used to evaluate the different alternatives individually and against each other to aid in selecting a remedy. This section of the Proposed Plan summarizes the relative performance of each alternative against the nine criteria, noting how each compares to the other options under consideration.

1. Overall Protection of Human Health and Environment

Alternative 5 is protective of human health and the environment by removing the landfill waste from the site and disposing of it in an authorized landfill facility. Alternative 4 is protective by containing the landfill onsite, and also provides an additional measure of protection by installing a landfill cap specifically designed to minimize infiltration into the landfill. Alternative 3 meets this threshold criterion by addressing only those areas of the landfill where corrective measures are required to limit ponding of storm water on the landfill surface, address areas susceptible to erosion, and limit the potential for contact with landfill materials that create a physical hazard to humans. Each of these alternatives would incorporate institutional controls and inspection and monitoring programs to monitor the site stability and condition of groundwater.

Alternative 1 and Alternative 2 do not meet the threshold criteria for overall protectiveness of human health and the environment. Alternative 1 does not meet this threshold criteria because it does not meet any of the RAOs. Alternative 2 does not meet this threshold criteria because it would not limit the potential for ponding on the landfill surface or further reduce the potential for erosion from wind or water.

Because Alternatives 1 and 2 do not meet this threshold criteria, it is not necessary to compare them with other alternatives as part of a comparative analysis.

2. Compliance with ARARs

Alternatives 3, 4, and 5 comply with the applicable contaminant-specific, action-specific, and location specific ARARS and relevant and appropriate requirements of the Wyoming Solid Waste Management Rules and Regulations relating to siting, operations, and closure of sanitary landfills.

3. Long-term Effectiveness and Permanence

Alternative 5 affords the highest degree of long-term effectiveness and permanence by physically removing landfill wastes from the site. Alternatives 3 and 4 are generally similar in being effective long-term onsite remedial alternatives. From a site stability perspective (e.g., limiting ponding of storm water, reducing erosion potential), Alternative 3 may be more effective than Alternative 4 because the loss of mature vegetation would be reduced and only localized areas would be addressed. Alternative 4 would require that the existing vegetation be destroyed and replaced with shallow-rooted grasses. Alternative 4 would also require that a significant amount of regrading and or fill material be placed, which may create additional future settlement across the site. Each of these alternatives would implement similar institutional controls and inspection and monitoring programs.

4. Reduction of Toxicity, Mobility, or Volume of Contaminants Through Treatment

None of the alternatives reduce toxicity, mobility, or volume through treatment. However, these alternatives are intended to reduce contaminant mobility through containment. Alternative 5 is the most effective because the wastes would be disposed and contained at an offsite landfill facility. Alternative 4 may be more effective than Alternative 3 in reducing contaminant mobility because an infiltration barrier would be installed thus reducing the likelihood of leachate formation and migration, whereas Alternative 3 relies more on the water storage capacity of the cover soil, and evapotranspiration processes. However, unburnt waste will be removed from the Landfill and disposed and contained at an off-site landfill facility under Alternative 3.

5. Short-term Effectiveness

Alternative 3 could be completed in the shortest period (1 to 2 months) of the alternatives and would be effective in achieving the RAOs within this short-term timeframe. Alternative 3 would have the least short-term impact on the community, workers, and the environment. Construction activities would be limited to localized areas around the landfill, and only identified unburned wastes would be exposed while excavating and loading trucks for disposal. The reduced amount of hauling of borrow soil and wastes would limit the volume of truck traffic required to complete the alternative.

Alternative 4 would be completed within 3 to 6 months and would be effective in achieving the RAOs within this timeframe. Alternative 4 would have an increased short-term impact on the community, workers, and the environment. Alternative 4 would require the entire site be disturbed, resulting in increased potential for

fugitive dust emissions. There would also be increased truck traffic required to transport borrow soils to construct the landfill cap.

Alternative 5 is not as effective in the short-term at achieving the RAOs as it would take 6 to 12 months to complete. Alternative 5 would have the greatest short-term impact on the community, workers, and the environment. Alternative 5 would also require disturbing the entire site, and handling of the greatest amount of landfill wastes, resulting in an increased exposure to contaminants. There would also be increased truck traffic to transport waste, concrete, and demolition debris to an offsite facility.

6. Implementability

Alternatives 3, 4, and 5 can be technically and administratively implemented. However, there are important technical uncertainties that differentiate the ability to effectively implement each alternative. Alternative 3 is the most efficient to implement with the fewest uncertainties, such as obtaining borrow soils, that could impact the level of effort and cost to complete. Alternative 4 could be implemented in a similar fashion to Alternative 3, but the level of effort is increased to complete the work, and there would be additional uncertainty in obtaining borrow soils for construction of the cap in near proximity to the landfill. Alternative 5 is the least implementable of the alternatives because of the increased level of effort required and the uncertainties in the amount of waste that would ultimately be disposed at an authorized landfill facility.

7. Costs

Costs are summarized in Table 1. Total costs in net present value are summarized in Table 3 below:

Table 3 – COST

Alternative	Cost
1. No Action	$ 0
2. Institutional Controls	$ 80,000
3. Localized Site Improvements	$ 4,900,000
4. Capping the Landfill	$ 7,700,000
5. Excavation and Removal	$ 9,900,000

8. State/Support Agency Acceptance

EPA and the WDEQ support the preferred alternative: Alternative 3 – Localized site Improvements.

9. Community Acceptance

Community acceptance of the preferred alternative will be evaluated after the public comment period ends and will be described in the Record of Decision (ROD) for the site.

SUMMARY OF THE PREFERRED ALTERNATIVE

After careful analysis and consideration, Alternative 3 – Localized Site Improvements has been chosen as the preferred alternative. This remedy consists of removing and disposing at a off-site landfill facility, the two areas of unburned waste, removal and recycling of the surficial concrete and construction debris, placement of clean fill on the landfill to ensure proper drainage and to prevent storm water ponding and erosion, and re-planting of the area. Site activities are expected to take approximately about 1 to 2 months to complete. This remedy also includes surface and groundwater monitoring to evaluate the effectiveness of the remedy. Because the landfill will remain in place, additional institutional controls will be implemented as described in Alternative 2.

This Localized Site Improvements alternative is preferred because it represents the best balance of the decision criteria used by the EPA as described in Table 2. This action has been chosen because it is protective of human health and the environment, complies with ARARs, is reliable in control, reduces contaminant mobility, will be cost effective and will use long-term solutions. This alternative will effectively meet RAOs.

Based on the information available at this time, the USAF, EPA and WDEQ believe the Preferred Alternative will be protective of human health and the environment and will comply with ARARs, although the Preferred Alternative can change in response to public comment or new information.

COMMUNITY PARTICIPATION

The USAF, EPA and WDEQ provide information regarding the cleanup of F. E. Warren to the public through public meetings, the Administrative Record for the site, quarterly newsletters, direct mailing to interested parties and announcements published in the Wyoming Tribune-Eagle. The USAF, EPA and WDEQ encourage the public to gain a more comprehensive understanding of the site and the Superfund activities that have been conducted at the site. The dates for the public comment period; the date, location, and time of the public meeting; and the locations of the Administrative Record files are provided on the front page of this Proposed Plan.

For further information on Landfill 4, Zone E, please contact:

Mr. John Wright
F. E. Warren Remedial Project Manager (RPM)
(307) 773-4147
john.wright@warren.af.mil

Mr. Robert Stites
U.S. EPA Region 8 RPM
(800) 227-8917, ext 6658
stites.rob@epa.gov

Ms. Jane Cramer
WDEQ RPM
(307) 777-7092
jcrame@state.wy.us

GLOSSARY OF TERMS

Specialized terms used in this Proposed Plan are defined below:

Administrative Record – a record of all documents and correspondence for the Installation Restoration Program under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA).

Analyte – the sample constituent whose concentration is sought in a chemical analysis.

Applicable or relevant and appropriate requirements (ARARs) – the federal and state environmental laws that a selected remedy will meet. These requirements may vary among sites and alternatives.

Groundwater – underground water that fills pores in soils or openings in rocks to the point of saturation.

Long term monitoring -– Physical and chemical measurements over time (several years) to evaluate performance.

Monitoring – Ongoing collection of information about the environment that helps gauge the effectiveness of a cleanup action.

Operations and maintenance (O&M) – running a treatment system and doing needed repairs.

Organic compounds – carbon compounds, such as solvents, oils, and pesticides. Most are not readily dissolved in water. Some organic compounds can cause cancer.

Present worth analysis – a method of evaluation of expenditures that occur over different time periods. By discounting all costs to a common base year, the costs for different remedial action alternatives can be compared on the basis of a single figure for each alternative. When calculating present worth cost for Superfund sites, total operations and maintenance costs are to be included.

Remedial Action Objectives (RAO) – the stated objectives for actions at the site.

Revegetate – to replace topsoil, seed, and mulch on prepared soil to prevent wind and water erosion.

ACRONYMS USED IN THIS PROPOSED PLAN

ARAR	Applicable and Appropriate Requirements
bgs	below ground surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
DDE	dichloro-2,2-bis(p-chlorophenyl)ethylene
DDT	dichlorodiphenyltrichloroethane
EPA	Environmental Protection Agency
FEMA	Federal Emergency Management Agency
F. E. Warren	F. E. Warren Air Force Base
FS	Feasibility Study
IRP	Installation Restoration Program
LF4	Landfill 4
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPL	National Priorities List
O&M	Operations and Maintenance
PAH	Polycyclic Aromatic Hydrocarbons
PCB	Polychlorinated Biphenols
PCE	Polychloroethene
RAO	Remedial Action Objective
RI	Remedial Investigation
RI/FS	Remedial Investigation/ Feasibility Study

ROD	Record of Decision
SWRA	Surface Water Risk Assessment
TCE	Trichloroethene
USAF	United States Air Force
VOC	Volatile Organic Compound
WDEQ	Wyoming Department of Environmental Quality

USE THIS SPACE TO WRITE YOUR COMMENTS

Your input on the Proposed Plan for Landfill 4 is important to the USAF. Comments provided by the public are valuable in helping the USAF select a final cleanup remedy for the site.

You may use the space below to write your comments, then fold and mail. Comments must be postmarked by **9 October 2003**. If you have any questions about the comment period, please contact John Wright at (307) 773-4147 or submit your comments to the USAF via email at the following e-mail address: john.wright@warren.af.mil. Verbal comments may also be submitted at the public meeting.

Name _____

Address _____

City _____

State _____ Zip _____

Mr. John Wright
F. E. Warren Remedial Project Manager
90 SW/EM
300 Vesle Drive, Building 367
F. E. Warren AFB, WY 82005